



State of Nevada – Department Of Personnel

CLASS SPECIFICATION

<u>TITLE</u>	<u>GRADE</u>	<u>EEO-4</u>	<u>CODE</u>
DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SUPERVISOR	37	A	6.963
DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SPECIALIST II	35	C	6.965
DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SPECIALIST I	33	C	6.967

SERIES CONCEPT

This class series encompasses positions that perform specialized electronic technician work involving the fabrication, installation, maintenance, repair and modification of both hardware and network software for digital Local Area Networks (LANS), digital Wide Area Networks (WANS), and telecommunications systems (telecom). Responsibility involves the 24-hour operation of WANS, LANS, and telecommunications systems in a geographical area or on a statewide basis for multiple or independent agency within State Government.

Incumbents are responsible for ensuring the continued operation of the agencies' analog and digital telephone system, digital data networks and facilities, customer service units/digital service units (csu/dsu), modems, bridges, routers, multiplexors (muxes), protocol converters, digital repeaters, transceivers, transducers, and coaxial, fibre and twisted pair cable plants as well as electrical systems, back up power systems and the installation, maintenance and repair of these systems, and multiple channel information logging tape and disk recorders, data terminals, printing systems, wireless LANS, compressed video devices, "T" carrier equipment, ISDN and Data Path equipment, Digital Data Services (DDS), Uninterruptible Power Systems (UPS), and all the network and operating software required to make these devices operate in concert to make up a usable, dependable, LAN and WAN network.

Incumbents install, repair, and align the above example units and systems down to component level and must be able to align and troubleshoot equipment making frequency, modulation, distortion, noise and power measurements using test equipment such as oscilloscopes, current power and voltmeters, spectrum analyzers, baseband analyzers, T1 test sets, trunk test sets, reflectometer test sets, sweep generators, tuning and adjusting tools, microcomputers (PC) and microprocessor controlled test/status/alarm equipment.

Incumbents install, update, analyze and debug the software in the network devices to keep the LAN, WAN, and telecom systems operating in an assigned area of the state and statewide. They use skills and abilities in human interaction with users, vendors, and public service providers to settle issues of policy, usage, and procedure with respect to LANS and WANS.

Incumbents install, repair, and align modules such as RF amplifiers, oscillator modulators, multipliers, preamplifier-mixer units, coaxial filters, isolators, frequency synthesis circuits, phase locked oscillators and automatic frequency controls, bridges multiplexors, csu/dsus, modems, routers, transceivers, transducers, and coax, fibre, and twisted pair cable plants using advanced trouble shooting skills and understanding of electronics theory and network software at an engineering level in order to keep the network hardware and software operating at peak efficiency.

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SERIES CONCEPT (cont.)

Incumbents install, repair, and align receivers, baseband and ancillary modules, wide band receiver amplifier assemblies, noise detectors, delay and slope equalization units, band pass filters, bridge assemblies, error and fault sensing units, baseband switching equipment, multiple output power supplies and reference oscillators using test equipment described above to keep units within the communications system operational.

Incumbents install, repair, align and troubleshoot other communications equipment such as frequency and digital multiplex equipment, digital encoding equipment, telephone interconnect and switching equipment, control console systems, multiple channel and network information logging devices, data terminals and printing systems, LAN and WAN digital network equipment, grounding system and surge protection equipment using both software and test equipment requiring and understanding of switched and packet networks, routing tables, network protocols, protocol conversion, and schematics in order to keep the total communications system operational.

Incumbents repair, calibrate and maintain test equipment listed above using applied hardware and software theory and tools in order to assure continued ability to maintain other communications equipment down to component level.

Incumbents install cabling and cable distribution systems in agency facilities allowing telephone, LAN and WAN digital networks, and radio systems to be inter-connected and distributed to offices and buildings as necessary using coaxial, fibre, and twisted pair technology in both broadband and baseband technology.

Incumbents are responsible for the shop's inventory of parts and equipment and maintains replacement and repair stock by researching part numbers, descriptions, and prices.

Incumbents prepare and maintain all documentation of work completed, files for the system and vendor information for the assigned work area in order to provide a tracking system for completed maintenance and installation of components and units of the system.

Incumbents provide training to Department personnel in the maintenance, repair and usage of digital network, LAN, WAN, and telecommunications equipment for both hardware and software.

CLASS CONCEPTS

DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SUPERVISOR

Under general direction, performs the full range of duties in the series concept and in addition, supervises a staff of digital network/telecommunications specialists on a geographical area or statewide basis and is responsible for providing design review, research and development review

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CLASS CONCEPTS (cont.)

of an agencies statewide digital network/telecommunications system. Works directly with users, vendors and public service providers, concerning policy, usage, and procedure with respect to LANS and WANS.

Conducts LAN, WAN, and communications site and users site engineering review including frequency allocation, site layout, installation methods, interconnection methods, site power sizing and determination of power source types for each additional site or site to be modified and determines the cable types, local topologies, protocols, and LAN and WAN digital network equipment to be used.

Performs comparative analysis of existing system configuration with proposed improvements to ensure compatibility of old and new system parts, technology and techniques and adapts to the new system to improve reliability, efficiency and cost effectiveness. Develops and implements technical parameters and standard practices for the installation, maintenance and repair of digital network and telecommunication equipment and to ensure the integrity of the systems is maintained.

Performs needs analysis concerning the agency/department statewide communications system. Writes detailed plans and other documentation to meet identified needs including annual work plans and broad system improvements and strategy.

DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SPECIALIST II

Under direction, at the advanced journey level, performs the full range of duties in the series concept and in addition, acts as a first-line supervisor over lower level Digital Network/Telecommunications System Specialists and/or independently functions as staff specialist with geographical responsibility for providing installation, repair and maintenance of an agency's LANS, WANS, digital and telecommunications system.

Digital Network/Telecommunications System Specialist II's in large departments may be given responsibility for an entire Division's Digital Network/Telecommunications System on a or geographical/or statewide basis. This requires coordination between other divisions or agencies to perform system engineering review and design, research and development review including frequency allocation, site layout, installation methods, interconnection methods, topologies, protocols, LAN and WAN digital network equipment, site power sizing and determination of power source types for each additional site or site to be modified as well as the repair and maintenance of a statewide communication system. Works directly with users, vendors and public service providers, concerning policy, usage, and procedure with respect to LANS and WANS.

Independently conducts research and development of custom software and circuit boards and sub-systems to provide necessary system components which are unavailable from commercial sources or which require modification for use with existing components and digital network and telecommunications systems.

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CLASS CONCEPTS (cont.)

Provides on-site direction and assistance to other digital network/system specialists to facilitate reliable, efficient, cost effective service to the agency.

Coordinates with other communications entities such as other private, federal and state agencies in the repair, maintenance and modification of the agency's digital network and telecommunications system.

DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SPECIALIST I

Under general supervision of a digital Network/Telecommunications System Specialist II or Supervisor, at the journey level, performs the full range of duties described in the series concept regarding the installation, repair and maintenance of an agency's digital network and telecommunications systems.

MINIMUM QUALIFICATIONS

DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SUPERVISOR

EDUCATION AND EXPERIENCE:

I

Bachelor's degree in electrical engineering or closely related field and three years of experience in data communication networks involving the fabrication, installation, maintenance, repair and modification of both hardware and network software; OR

II

Associate's degree in electronics or closely related field and five years of experience as described in option I; OR

III

Two years of experience at the Digital Network/Telecommunications System Specialist II level in Nevada State service; OR

IV

An equivalent combination of education and experience in which the applicant has demonstrated possession of the entry level knowledge, skills and abilities.

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MINIMUM QUALIFICATIONS (cont.)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES: (These may be acquired on the job and/or needed to perform the work assigned.)

General knowledge of network protocols such as TCP/IP, IPX, IBM SNA, Novell NETWARE, Sun NFS, APPLETALK, XWINDOWS, SDLC, and EIA. Working knowledge of network Topologies such as Ethernet, RF broadband, 4/16 bit Token Ring, FDDI, IBM PC network, 10 base T, Archnet, Localtalk, and Fiber Optics. General knowledge of telecommunication circuitry such as DDS lines, ISDN and both fractional and full TI carriers. General knowledge of multi-media applications such as video conferencing, and voice and data multiplexing. Working knowledge of computer operating systems and software such as UNIX, MS-DOS and Netware. Working knowledge in both software and hardware of network products such as gateways, routers, bridges, hubs, repeaters, multiplexers, and modems. General knowledge of network management standards such as Routing Information Protocol (RIP), Simple Network Management Protocol (SNMP), source routing, and spanning tree protocol. General knowledge of computer aided design software packages to design and update statewide agency's network maps and documentation. General knowledge of personnel principles and practices. Working knowledge of department policy and procedure as applied to assigned projects.

Ability to perform network and system administration duties on UNIX client servers, Novell file servers, and network controller databases. Ability to perform system engineering design, review, research, and development, which includes frequency allocation, site layout, installation methods, topologies, protocols, location of sources for equipment and parts, and cost estimates. Ability to perform needed analysis concerning the agency wide communications system. Write detailed plans and other documentation to meet identified needs including annual work plans, broad system improvements and strategy. Ability to report detailed descriptions and requirements to service vendors regarding equipment purchases. Ability to understand various service vendor's terminology such as those used by common carriers. Ability to provide on-site direction and assistance to other state wide agencies to facilitate reliable, efficient, cost effective network service. Ability to coordinate with other communication entities such as private, federal and state agencies in the repair, maintenance and modification of the agency's digital network and telecommunications system. Ability to coordinate work assignments with state wide agencies, agency staff and subordinates. Ability to make accurate assessments and decisions needed to resolve emergency and critical situations.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES: (Applicants will be screened for possession of these through written, oral, performance or other evaluation procedures.)

Working knowledge of basic Analog theories, principles and practices. Working knowledge of basic digital theories, principles and practices. Working knowledge of safety precautions associated with working with sensitive electronics, high voltage and hazardous chemicals.

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MINIMUM QUALIFICATIONS (cont.)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES: (cont.)

Ability to read complex schematics, drawings, technical manuals, and architectural designs. Ability to write concise and accurate technical reports, business correspondence and electronic mail. Ability to converse with individuals of various cultural and educational backgrounds. Ability to share knowledge, ideas, helpful hints with end-users, colleagues, and students. Ability to give clear and concise direction and training to lower level technicians and students. Ability to keep informed and updated on the rapid growth and technical advances in LAN and WAN technology. Ability to prioritize and schedule work for self and a staff of students and fellow technicians. Ability to supervise the activities of assigned staff including delegation of responsibility, training, and evaluating effectiveness. Ability to resolve problems diplomatically with the state wide agencies, agency staff, vendors, contractors and the general public. Ability to prioritize and schedule work based on necessity and severity of the problem or task. Ability to perform under the stress of frequent interruptions often changing from one task to another. Ability to adjust to fact changing priorities and schedules.

Skill in soldering techniques and rework procedures. Skill at isolating the cause of network software and hardware problems to modular and component levels. Skill in operating sophisticated electronic test equipment such as spectrum analyzers, data analyzers, oscilloscopes, digital and analog meters, and signal generators.

In addition, all other knowledge, skills and abilities required at the lower levels of this series.

DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SPECIALIST II

EDUCATION AND EXPERIENCE:

I

Bachelor's degree in electrical engineering or closely related field and one year of experience in data communication networks involving the fabrication, installation, maintenance, repair and modification of both hardware and network software; OR

II

Associate's degree in electronics or closely related field and three years of experience as described in option I; OR

III

One year of experience at the Digital Network/Telecommunications System Specialist I level in Nevada State service; OR

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MINIMUM QUALIFICATIONS (cont.)

EDUCATION AND EXPERIENCE: (cont.)

IV

An equivalent combination of education and experience in which the applicant has demonstrated possession of the entry level knowledge, skills and abilities.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES: (These may be acquired on the job and/or needed to perform the work assigned.)

General knowledge of network protocols such as TCP\IPX, IPX, IBM, SNA\NON SNA, NOVELL NETWARE, SUN NSF, APPLETALK, XWINDOWS, SDLC, HDLC, EIA, V.35, RS449 standards. Working knowledge of computer operating systems such as UNIX, MS-DOS and IBM MVS.

Ability to provide training and direction to lower level technicians to ensure tasks are carried out in accordance with system standards. Ability to perform network and system duties on UNIX client servers, Novell client servers and the network controllers data base. Ability to configure interface equipment for televideo systems. Ability to analyze network problems and make necessary repairs.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES: (Applicants will be screened for possession of these through written, oral, performance or other evaluation procedures.)

Working knowledge of Analog and Digital electronics. Working knowledge of telephone company technologies such as T1 and Fractional T1, ISDN, DDS, Data Path, Compressed Video and Dial services. Working knowledge of local area network and Wide area networks which utilizes interface equipment such as Network Bridges, Routers, Multiplexers, Modems tat are used to inter-connect and distribute to offices and buildings as necessary using Coaxial, Fiber Optic and Twisted pair technologies. Working knowledge of network topologies such as RF Board band, Thick and Thin Ethernet, Token Ring, 10 base T and PC networking. Working knowledge of safety precautions when working with electronic equipment or circuitry. Working knowledge of math skills pertaining to electronics applications.

Ability to use electronic test equipment such as an oscilloscope, Volt/Ohm meter, Data Analyzer, Signal Generator, Broadband Spectrum Analyzer, Data Recorders and Baseband Analyzer. Ability to use a micro computer. Ability to use hand tools and soldering iron. Ability to make mechanical modifications and to be able to fabricate network interface cables. Ability to read and maintain technical manuals. Ability to interpret electronic schematics and mechanical drawings. Ability to establish and maintain network schematics and drawings. Ability to properly maintain inventory records including shipping and receiving logs. Ability to write routine business correspondence. Ability to deal effectively with persons of various cultural and educational backgrounds. Ability to work independently and follow through on assignments with minimal supervision and direction. Ability to establish rapport with system users and service vendors. Ability to work as part of a team to ensure smooth department operations.

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MINIMUM QUALIFICATIONS (cont.)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES: (cont.)

In addition, all other knowledge, skills and abilities required at the lower levels of this series.

DIGITAL NETWORK/TELECOMMUNICATIONS SYSTEM SPECIALIST I

EDUCATION AND EXPERIENCE:

I

Bachelor's degree in electrical engineering or closely related field; OR

II

Associate's degree in electronics or closely related field and two years of experience in data communication networks involving the fabrication, installation, maintenance, repair and modification of both hardware and network software; OR

III

An equivalent combination of education and experience in which the applicant has demonstrated possession of the entry level knowledge, skills and abilities.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES: (These may be acquired on the job and/or needed to perform the work assigned.)

General knowledge of telephone company technologies such as T1 and Fractional T1, ISDN, DDS, Data Path, Compressed Video and Dial services. Working knowledge of local area networks and wide area networks which utilizes interface equipment such as Network Bridges, Routers, Multiplexers, Modems that are used to inter-connect and distribute to offices and buildings as necessary using Coaxial, Fiber Optic and Twisted pair technologies. Working knowledge of network topologies such as RF Board Band, Thick and Thin ethernet, Token Ring, 10 base T and PC networking.

Ability to use test equipment such as Data Analyzer, Signal Generator, Broadband Spectrum Analyzer, Data Recorders and Baseband Analyzers. Ability to establish and maintain network schematics and drawings. Ability to properly maintain inventory records including shipping and receiving logs. Ability to establish a rapport with system users and service vendors. Ability to work as a team member to ensure smooth department operations.

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MINIMUM QUALIFICATIONS (cont.)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES: (Applicants will be screened for possession of these through written, oral, performance or other evaluation procedures.)

Working knowledge of Analog and Digital electronics. Working knowledge of safety precautions when working with electronic equipment or circuitry. Working knowledge of math skills pertaining to electronics applications and basic practical usage.

Ability to use electronic test equipment such as an oscilloscope, Volt/Ohm meter and Protocol Analyzer, Ability to use a micro computer. Ability to use hand tools and soldering iron. Ability to make mechanical modifications and to be able to fabricate network interface cables. Ability to read and maintain technical manuals. Ability to interpret electronic schematics and mechanical drawings. Ability to write routine business correspondence. Ability to communicate with persons of various cultural and educational backgrounds. Ability to work under minimal supervision and follow through with assignments.

This class specification is used for classification, recruitment and examination purposes. It is not to be considered a substitute for work performance standards for positions assigned to this class.

ESTABLISHED:	<u>6.963</u> 7/1/93P 8/31/92PC	<u>6.965</u> 7/1/93P 8/31/92PC	<u>6.967</u> 7/1/93P 8/31/92PC
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